

this by 8 for the total amount in twenty-four hours in centimeters, 1 cm=0.394 inch. Plotting this value on the curves of figs. 23-27 and noting the times of occurrence of this ordinate, it is found to average about 10:30 a. m. and 10 p. m. That is to say, if a measure of the height of the water in the pan be made at 7:30 a. m., and another at 10:30 a. m., the difference multiplied by 8 will be closely the total evaporation for the day. This rule holds at Reno, Nev., during the summer, but it should be verified in other localities. Furthermore, in the arid regions of the West it seems probable that a lake or reservoir evaporates about five-eighths as fast as an isolated pan placed outside

the vapor blanket; in other words, this vapor blanket seems to conserve about three-eighths of the water that would otherwise be lost by the evaporation. It is important that similar experiments with towers be made in the central and eastern portions of the United States, in the prevailing damp climates, to discover whether similar rules can be applied in practice. A careful campaign on the theory of evaporation is evidently demanded to elucidate this complex function of the evaporation of water in the open air, and it is probable that several years will be required in order to bring it to a satisfactory conclusion.

THE WEATHER OF THE MONTH.

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PRESSURE.

The distribution of mean atmospheric pressure for February, 1908, over the United States and Canada, is graphically shown on Chart VI, and the average values and departures from the normal are shown for each station in Tables I and III.

February mean pressure partook generally of the usual winter type, a ridge of high pressure, 30.10 to 30.15 inches, stretching from the east Florida coast northwestward to the upper Missouri Valley and thence southwesterly to the middle Pacific coast, diminishing gently to about 30.00 inches over the Canadian Maritime Provinces, the southern portions of Arizona and New Mexico, and over northwest Washington and British Columbia.

There was a decided increase in pressure from that of January, 1908, over the districts east of the Rocky Mountains, while over the Plateau districts a compensating decrease occurred.

Pressure averaged above the normal over practically all districts of the United States and Canada, except over the Pacific coast and the central Mississippi Valley.

The building up of the area of high pressure over the upper Missouri Valley and generally along the northern border brought nearly all districts east of the Missouri and Mississippi valleys under the influence of westerly and northwesterly surface winds, and over the northern tier of States from North Dakota eastward, including the Lake region, New England, and the north Atlantic coast, the month was unusually stormy, the average wind velocity at many points exceeding the normal from 30 to 50 per cent.

The extension of the south Atlantic high area westward over Texas and the Southwest gave southerly winds from the lower Mississippi Valley westward over Texas, and generally over the region from the Rocky Mountains to the Pacific. Over these districts storms were remarkably infrequent and the monthly wind movement was correspondingly less than the average.

TEMPERATURE.

The average temperature remained above the normal, as during the preceding months since October, inclusive, over most of the districts west of the Mississippi Valley, only a small area over the lower Colorado Valley and the central and south Pacific coasts showing temperatures slightly below the average.

Over the entire Missouri Valley and northern slope and Plateau districts the average temperature ranged from 4° to 8° above the normal, and across the border in the Canadian Northwest Provinces unusually mild weather was the rule thruout the month.

From the Missouri Valley westward to the Pacific and southward over most of the Great Plains, mountain, and Plateau districts the mean temperature has remained above the normal during the past five months, and the accumulated excess during that period ranges from about 2° daily in the more

southern portions to more than 7° daily over portions of Montana and the Dakotas.

Over the districts east of the Mississippi the average temperature was generally below the normal, the deficiency ranging from 3° to 5° daily over the Appalachian Mountain region, east Gulf States, and the Florida Peninsula.

During the first few days of the month a cold wave of considerable severity prevailed over the northern Rocky Mountain and Plateau districts, extending into the Great Plains and central valleys, but aside from the above no extended or severe periods of cold occurred over those districts.

The continuous discharge of cold winds from the Hudson Bay region over the lower Lakes and New England gave to those districts frequent and severe periods of cold.

Over the northern portions of New York and New England minimum temperatures from 30° to 40° below zero were recorded, the lowest reported in those districts for many years.

Temperatures as low as -40° were recorded also over the mountain districts of southeastern Idaho and northwestern Wyoming on the 1st and 2d, but these readings were probably due to the intense nocturnal radiation possible in the clear, dry atmosphere of that region, rather than to the intensity of the advancing cold area.

Altho temperatures were moderate over most of the northern districts, several periods of cold weather, for the latitude, penetrated into the Gulf and south Atlantic coast districts, and freezing temperatures with killing frosts occurred on numerous dates, extending to the immediate coast line and to the interior districts of central Florida.

PRECIPITATION.

The distribution of precipitation during February, 1908, is graphically shown on Chart IV by appropriate shading or by figures representing the actual amount of fall over districts the topography of which is too varied to admit of approximately correct shading.

The precipitation over the lower Ohio and middle Mississippi valleys was comparatively heavy, ranging from 6 to 10 inches; over the remaining districts east of the Mississippi River the amounts were very generally from 2 to 4 inches, except over southern Florida, where the fall averaged but slightly above 1 inch.

From the Missouri Valley and Great Plains westward over the Rocky Mountain and Plateau districts the amount of fall was generally less than 1 inch, except over portions of Arizona and New Mexico, where amounts from 2 to 6 inches were recorded.

Comparatively heavy precipitation, from 5 to 10 inches, occurred over the mountains near the coast of California, Oregon, and Washington, and also over the high elevations of the Sierra and Cascade ranges in those States.

Along the immediate Atlantic coast from New England to Florida, over the Appalachian district from Maryland southward, and the east Gulf States, there was a general deficiency in precipitation ranging from 1 inch to 3 inches.

Along the Rio Grande Valley, over western Texas and the central and northern portions of the mountain, Plateau, and Pacific coast districts, there was a general but small deficiency in the monthly amounts of precipitation.

Over the lower Lakes, the Ohio and lower Mississippi valleys, eastern Texas and portions of Arizona, the precipitation ranged from 2 to 5 inches above the normal, and there was a small excess over the greater portions of New England, the Middle Atlantic States, the upper Lakes, the Missouri and upper Mississippi valleys, the Great Plains and portions of New Mexico, southern California, and northern Washington.

Over California there was an unusual lack of precipitation from the 10th to 27th, but general rains on the last two days brought the monthly amounts well up to the average. Over the remaining districts the precipitation was generally well distributed during the various periods of the month.

Average temperatures and departures from the normal.

Districts.	Number of stations.	Average temperatures for the current month.	Departures for the current month.	Accumulated departures since January 1.	Average departures since January 1.
New England.....	12	22.9	- 3.1	- 0.8	- 0.4
Middle Atlantic.....	16	29.4	- 3.7	- 2.4	- 1.2
South Atlantic.....	10	44.0	- 3.9	- 3.9	- 2.0
Florida Peninsula *.....	8	58.8	- 3.0	- 2.0	- 1.0
East Gulf.....	11	47.6	- 3.3	- 3.4	- 1.7
West Gulf.....	10	50.3	+ 1.1	+ 4.6	+ 2.3
Ohio Valley and Tennessee.....	13	34.6	- 1.6	- 0.8	- 0.4
Lower Lake.....	10	21.2	- 3.3	- 1.9	- 1.0
Upper Lake.....	12	19.4	+ 0.4	+ 4.4	+ 2.2
North Dakota *.....	9	15.1	+ 8.0	+19.8	+ 9.9
Upper Mississippi Valley.....	15	27.0	+ 2.4	+ 7.7	+ 3.8
Missouri Valley.....	12	29.3	+ 4.9	+13.8	+ 6.9
Northern Slope.....	9	24.9	+ 3.7	+10.5	+ 5.2
Middle Slope.....	6	37.6	+ 5.2	+12.3	+ 6.2
Southern Slope *.....	7	45.8	+ 2.8	+ 7.2	+ 3.6
Southern Plateau *.....	12	42.9	+ 0.2	+ 3.0	+ 1.5
Middle Plateau *.....	10	31.0	+ 0.8	+ 3.6	+ 1.8
Northern Plateau *.....	12	33.2	+ 3.0	+ 6.0	+ 3.0
North Pacific.....	7	41.5	+ 0.8	+ 3.3	+ 1.6
Middle Pacific.....	8	48.7	+ 0.9	+ 0.8	+ 0.4
South Pacific.....	4	52.0	- 0.6	+ 1.9	+ 1.0

* Regular Weather Bureau and selected cooperative stations.

In Canada.—Director R. F. Stupart says :

The temperature was very slightly below the average in British Columbia, considerably above it from the Rocky Mountains to the Lake Superior region, much below the average from the Georgian Bay district eastward as far as the eastern part of the Province of Quebec, and above it in nearly all portions of the Maritime Provinces. In the Western Provinces the positive departures ranged from 8° to 12° and in the Maritime Provinces from 1° to 4°. The negative departures in Ontario ranged from 2° to 6° and in Quebec from 1° to 3°.

The precipitation was much in excess of the average over the greater portion of Canada, in most districts from 50 to 100 per cent more than the normal. It was, however, from 20 to 40 per cent deficient in Alberta, and there were also deficiencies of about 20 per cent very locally in British Columbia, Manitoba, and the southwestern portion of the Maritime Provinces.

In British Columbia at the close of the month the ground was bare of snow in portions of the lower levels of southern districts, whilst in the north and higher levels there was a deep covering.

Southern Alberta was bare of snow, while elsewhere the depth was almost generally about 3 inches. A depth of from 3 inches in the south to 12 inches in the north was reported from Saskatchewan. Manitoba was covered with snow to a depth of about 5 inches.

In Ontario the depth increased eastward from about 4 inches in the Rainy River district, and northward from 10 inches and over along the shores of the lower Lakes, to from 30 to 46 inches in the Georgian Bay, Temiskaming, and Ottawa Valley districts.

The western portion of Quebec was snow-covered to a depth of from 30 to 50 inches, while the Gaspé Peninsula had 24 inches.

In the Maritime Provinces the depth decreased from nearly 20 inches in the northern parts until there was only a trace on the ground in southern New Brunswick and in Nova Scotia.

Average precipitation and departures from the normal.

Districts.	Number of stations.	Average.		Departure.	
		Current month.	Percentage of normal.	Current month.	Accumulated since Jan. 1.
		Inches.		Inches.	Inches.
New England.....	12	3.92	115	+0.5	-0.1
Middle Atlantic.....	16	8.53	113	+0.5	+0.3
South Atlantic.....	10	8.58	86	-0.6	-0.3
Florida Peninsula *.....	8	2.15	66	-1.1	-1.3
East Gulf.....	11	4.98	102	+0.1	+0.4
West Gulf.....	10	3.27	118	+0.5	-0.6
Ohio Valley and Tennessee.....	13	4.31	116	+0.6	-0.7
Lower Lake.....	10	3.90	156	+1.4	+0.7
Upper Lake.....	12	2.56	145	+0.8	+0.3
North Dakota *.....	9	1.20	240	+0.7	+0.3
Upper Mississippi Valley.....	15	2.72	144	+0.9	+0.1
Missouri Valley.....	12	2.13	188	+1.0	+0.5
Northern Slope.....	9	0.78	89	-0.1	-0.4
Middle Slope.....	6	1.36	179	+0.6	+0.3
Southern Slope *.....	7	0.95	90	-0.1	-0.3
Southern Plateau *.....	12	1.48	137	+0.4	+0.3
Middle Plateau *.....	10	1.10	92	-0.1	-0.3
Northern Plateau *.....	12	1.12	74	-0.4	-1.3
North Pacific.....	7	5.25	93	-0.4	-1.6
Middle Pacific.....	8	4.82	114	+0.6	+1.1
South Pacific.....	4	2.85	116	+0.4	+1.7

SNOWFALL.

More than the usual amount of snow occurred over the Appalachian Mountain region, New England, the Lake region, the Ohio and upper Mississippi valleys, and generally along the northern tier of States.

In the mountain regions of the west considerable snow occurred, especially over the more southerly districts, but the warm weather prevailing during the month prevented any decided increase in the depths accumulated at the end of January.

The greater part of the snow remaining on the ground in high elevations of the mountain districts, having fallen early in the season, is generally well-packed and probably above the average in water contents, thus assuring comparatively slow melting, and a moderate supply of water for irrigation until late in the season.

The distribution of the monthly fall and the amounts remaining on the ground at the end of the month are graphically shown on Charts VII and VIII.

HUMIDITY AND SUNSHINE.

From Texas eastward over the Gulf and Atlantic coast States there was a pronounced deficiency in the average relative humidity, also over the upper Lakes and portions of the central Plains and Rocky Mountain region.

Over most of the Missouri and upper Mississippi valleys, the northern tier of States from the upper Lakes westward and over the greater part of the Plateau and Pacific coast districts, there was an excess of relative humidity, the average in portions of New Mexico, Arizona, and California ranging from 10 to 30 per cent above the normal.

Cloudy, rainy weather was in excess of the average over most of the districts east of the Mississippi Valley, except Florida, and also over Arizona and portions of New Mexico. From the Missouri Valley westward, and over the Pacific slope there was generally more than the average amount of sunshine.

As a whole the month was unfavorable for outdoor occupations over most of the eastern districts, but over the great agricultural and stock-raising districts of the west conditions were favorable for the nearly uninterrupted pursuit of the usual outdoor occupations.

Maximum wind velocities.

Stations.	Date.	Velocity.	Direction.	Stations.	Date.	Velocity.	Direction.
Alpens, Mich.....	5	52	se.	Mount Weather, Va.....	27	52	nw.
Atlanta, Ga.....	1	56	nw.	Nantucket, Mass.....	1	58	se.
Do.....	15	50	nw.	Do.....	2	50	sw.
Block Island, R. I.....	1	58	se.	New Haven, Conn.....	1	54	se.
Do.....	2	60	sw.	New York, N. Y.....	1	54	w.
Do.....	4	52	nw.	Do.....	2	58	w.
Do.....	8	60	nw.	North Head, Wash.....	4	54	s.
Do.....	9	50	nw.	Do.....	5	72	se.
Do.....	15	60	s.	Do.....	6	50	s.
Buffalo, N. Y.....	1	76	sw.	Do.....	10	54	s.
Do.....	2	57	w.	Do.....	11	60	nw.
Do.....	6	54	w.	Do.....	15	56	se.
Canton, N. Y.....	1	56	w.	Do.....	16	54	se.
Chicago, Ill.....	5	54	w.	Do.....	26	60	sw.
Cleveland, Ohio.....	1	60	w.	Oklahoma, Okla.....	14	60	nw.
Do.....	6	51	sw.	Pittsburg, Pa.....	1	56	w.
Do.....	15	56	nw.	Do.....	6	54	w.
Detroit, Mich.....	5	58	sw.	Point Reyes Light, Cal.....	2	60	se.
Do.....	6	54	sw.	Do.....	8	70	s.
Duluth, Minn.....	1	52	nw.	Do.....	9	78	n.
Do.....	16	54	nw.	Do.....	10	53	nw.
Eastport, Me.....	1	69	se.	Do.....	11	61	nw.
El Paso, Tex.....	13	51	w.	Do.....	12	62	nw.
Do.....	17	54	w.	Do.....	17	51	n.
Erie, Pa.....	1	54	w.	Do.....	18	50	nw.
Fort Worth, Tex.....	14	53	nw.	Do.....	26	54	nw.
Grand Haven, Mich.....	5	50	sw.	Do.....	28	54	sw.
Green Bay, Wis.....	18	52	ne.	Do.....	29	70	s.
Kansas City, Mo.....	5	53	nw.	Portland, Me.....	1	61	se.
Madison, Wis.....	19	54	ne.	Sioux City, Iowa.....	5	50	nw.
Milwaukee, Wis.....	5	60	se.	Southeast Farallon, Cal.....	8	53	s.
Mount Tamalpais, Cal.....	2	52	se.	Do.....	29	54	sw.
Do.....	17	60	nw.	Syracuse, N. Y.....	6	62	s.
Do.....	29	58	sw.	Tatoosh Island, Wash.....	5	56	s.
Mount Weather, Va.....	1	58	nw.	Do.....	10	50	w.
Do.....	2	60	nw.	Do.....	26	56	s.
Do.....	3	53	nw.	Toledo, Ohio.....	1	53	sw.
Do.....	7	54	nw.	Do.....	5	55	sw.
Do.....	15	50	nw.	Do.....	6	52	sw.
Do.....	16	53	nw.				

Average relative humidity and departures from the normal.

Districts.	Average.	Departure from the normal.	Districts.	Average.	Departure from the normal.
New England.....	74	- 1	Missouri Valley.....	75	0
Middle Atlantic.....	73	- 1	Northern Slope.....	73	+ 2
South Atlantic.....	74	- 2	Middle Slope.....	65	- 2
Florida Peninsula.....	75	- 5	Southern Slope.....	59	- 8
East Gulf.....	68	- 8	Southern Plateau.....	57	+10
West Gulf.....	70	- 4	Middle Plateau.....	69	- 1
Ohio Valley and Tennessee.....	73	- 1	Northern Plateau.....	73	0
Lower Lake.....	81	+ 1	North Pacific.....	82	+ 1
Upper Lake.....	80	- 2	Middle Pacific.....	81	+ 4
North Dakota.....	84	+ 4	South Pacific.....	74	+ 5
Upper Mississippi Valley.....	77	0			

Average cloudiness and departures from the normal.

Districts.	Average.	Departure from the normal.	Districts.	Average.	Departure from the normal.
New England.....	5.4	- 0.1	Missouri Valley.....	5.6	+ 0.2
Middle Atlantic.....	5.7	+ 0.1	Northern Slope.....	5.6	+ 0.3
South Atlantic.....	4.9	- 0.4	Middle Slope.....	4.8	+ 0.4
Florida Peninsula.....	3.7	- 0.9	Southern Slope.....	5.0	+ 0.2
East Gulf.....	5.4	- 0.1	Southern Plateau.....	4.0	+ 1.0
West Gulf.....	5.0	- 0.8	Middle Plateau.....	5.0	+ 0.2
Ohio Valley and Tennessee.....	6.9	+ 0.7	Northern Plateau.....	6.4	- 0.3
Lower Lake.....	6.9	+ 0.1	North Pacific.....	7.2	+ 0.2
Upper Lake.....	7.3	+ 1.0	Middle Pacific.....	5.4	+ 0.6
North Dakota.....	6.1	+ 1.0	South Pacific.....	5.1	+ 1.0
Upper Mississippi Valley.....	5.8	+ 0.5			